HP Netserver AA Solution Installation Guide

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SOFTWARE REVISION

The revision of the Endurance software that this document supports is Revision 4.0.0-RL.EA.

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Preface

This guide describes how to install the HP Netserver AA Solution Endurance® server, the Assured Availability™ solution from the Hewlett-Packard Company.

Audience

This guide is written for experienced network administrators and technical personnel responsible for installing, configuring, administering, and managing network server hardware and software, including Microsoft® Windows®.

This guide assumes that you are familiar with the Endurance terminology described in the *HP Netserver AA Solution Administrator's Guide*.

Documentation Set

The Endurance documentation set includes:

- *HP Netserver AA Solution Installation Guide* that describes how to install your Endurance server.
- *HP Netserver AA Solution Administrator's Guide* that describes the Endurance server and its related Endurance applications. This guide also includes information about how to monitor and manage your Endurance server.
- *HP Netserver AA Solution Messages* that lists and describes all Endurance messages. *HP Netserver AA Solution Messages* is not shipped in printed form. It is only available online using the HP Netserver AA Solution Endurance CD-ROM.
- *Endurance Release Notes* that describes release-specific information, including installation requirements, operational information, and known product limitations that are not documented in the HP Netserver AA Solution documentation set. You should read the *Release Notes* before installing and using the Endurance server.

All the documentation is available online using the HP Netserver AA Solution Endurance CD-ROM that was shipped with your HP Netserver AA Solution kit.

Conventions

The following conventions are used in the Endurance server documentation set:

Convention	Description
`Italics, Courier font`	Indicates a variable that you replace in a path name or command
`Bold, Courier font`	Indicates actions or commands that you must type. For example, type **`A:\ETX`**
`Courier font`	Represents examples of screen text. For example, `scsiid = 0, 1`.
Bold	Is used to: • Emphasize important information. • Indicate menu, pathname, or button selections. • Indicate actions you perform.
Italics	Is used to: • Highlight the state of the Endurance server component. • Refer to manual, chapter, or section titles.
Blue text	(Available only in online documentation.) Indicates a hyperlink (cross-reference to another section of the Endurance documentation set). Clicking on the link takes you to the appropriate place in the documentation set.
Caution	Is used to indicate procedures you should not perform or situations you should avoid in order to avoid personal injury.
Warning	Is used to indicate procedures or actions that could cause file or data corruption, loss of data, or damage to server components.

Unless noted otherwise, all cross-references are to chapters and pages within this book.

For Customer Support

Refer to the ***Warranty & Support for Your HP NetServer*** booklet supplied with your NetServer for information relating to warranty or customer support.

Preparing for the Installation

1

This chapter describes hardware and software requirements needed to install the Endurance server. It also discusses what you need to do to prepare your site.

This chapter also introduces you to some Endurance terminology and concepts (described in detail in the *HP Netserver AA Solution Administrator's Guide*).

This chapter includes the following sections:

Overview of the Endurance Server 1-2
Installation Requirements 1-6
Planning the SCSI Disk and CD-ROM Configurations 1-9
Unpacking Your Endurance Server Kit 1-14
Completing Initial Power-On Self Test 1-15

Overview of the Endurance Server

The fault tolerant Endurance server provides continuous computing and fully-redundant I/O devices for your Microsoft Windows operating system and its applications.

The main Endurance components include:

Table 1-1 Endurance Components

Components	Description
2 Compute Elements (CEs)	The systems that provide all compute processing. The CEs run the operating system where you install and execute all applications.
2 I/O Processors (IOP)s	The systems that provides I/O resources, including I/O processing, data storage, and network connectivity.
4 Marathon Interface Cards (MICs)	The PCI-based adapters that enable bidirectional communication between system components.

The Endurance technology coordinates all I/O requests and responses between the CEs and IOPs in a redundant processing environment. Using redundant CEs and memory, the Endurance software performs CPU and memory functions in a tightly coupled manner. If there is a CPU or memory failure, the Endurance operating system remains continuously available, providing constant computing without any loss of context.

Figure 1-1 depicts a sample hardware configuration of the Endurance server.

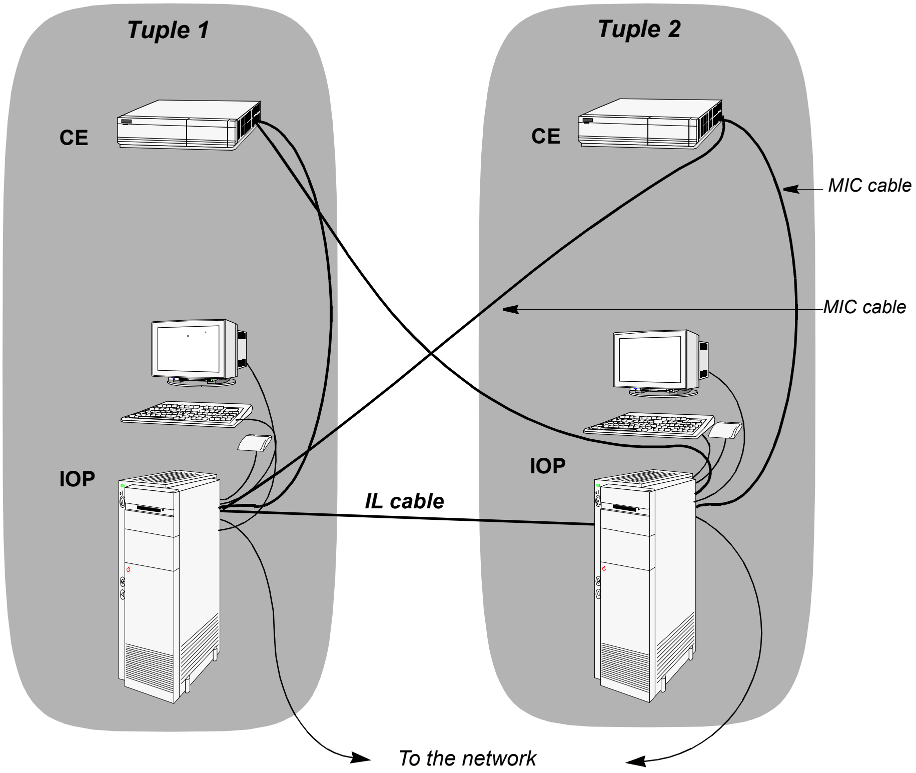


Figure 1-1 Sample Endurance Hardware Configuration

Device Redirection

Because all I/O devices in the server physically reside on the IOPs, Endurance software redirects all I/O requests from the CEs to the IOPs. As a result, these I/O devices are logically associated with the CE. For example, the Endurance software can redirect a CD-ROM drive physically located in an IOP so that it is logically assigned to the CE (the CE has complete control of that CD-ROM drive).

For mirrored disk devices and redundant Ethernet connections, the Endurance software coordinates all I/O processing so that these redundant components appear as a single logical device. For example, in a mirrored disk set, the two physical disks (one on each IOP) appear to the CE operating system and applications as one logical disk. If a disk failure occurs, the disk operations can transparently continue operating without affecting any server applications or clients.

Redirected Video and the CE Desktop Application

In the Endurance server, CE video output is redirected to the IOPs. To accomplish video redirection, the server uses kernel mode drivers and the CE Desktop application, an application that runs on the IOPs and displays CE video output in a window on the IOPs. To display CE video, you *must* run the CE Desktop application.

Virtual Network

The Endurance server includes a virtual network that provides LAN-style connectivity between the CEs and each IOP. This connectivity is independent of any public (redirected) CE or private (IOP) network adapters. It uses the Windows operating system resource sharing to provide connectivity between the CEs and IOPs regardless of whether the IOPs have dedicated network cards installed.

Endurance Manager

The Endurance Manager is a management application for the Endurance server. This application provides both a Windows-based GUI and a command prompt interface through which you can monitor and manage your server. You can install the Endurance Manager on a remote client, enabling you to monitor the system from another location.

Endurance Configuration Utility

The Endurance Configuration Utility enables you to define the Endurance server's hardware configuration and to store that configuration information in the appropriate locations of the Windows Registry. You use the Endurance Configuration Utility to configure the server initially, and also after making any changes to the Endurance server hardware configuration.

Fault Detection and Event Reporting

Endurance software continuously monitors the server. If it detects a fault, the Endurance server isolates the fault and deconfigures any affected components, ensuring that the server remains operational by automatically using the redundant components.

The fault detection and reporting process occurs seamlessly, and in a fully operational Endurance server, it maintains complete server availability. The Endurance software reports all events, including general status, state changes, and faults, to the Windows event logs or displays them in windows as they occur. Refer to *HP Netserver AA Solution Messages* for complete documentation of Endurance messages, which use the standard Windows operating system event format. Because the Endurance server uses standard message reporting, you can integrate standard applications to notify you when a fault occurs.

Installation Requirements

To complete the Endurance installation, you need to meet the hardware, software, and other requirements described in the following sections:

- *Hardware Requirements*
- *Software Requirements*

Hardware Requirements

To install the Endurance server, you need the following hardware:

Table 1-2 Endurance Server Hardware Requirements

Item	Notes
IOPs	The two IOPs must be Pentium® class PCI-bus PCs. Each IOP must have: • A minimum of 256 MB of system memory • The capability of restarting automatically after a power failure. On some systems, you may need to select options for automatic restart in the system Setup utility. • A SCSI system disk for the local copy of the version of the Windows operating system you are using • SCSI Host Based Adapter (HBA) • One SCSI-based or IDE CD-ROM • One SCSI IOP boot device (a physical drive or a logical drive from a hardware RAID set) • At least one SCSI hard disk that meets the requirements listed in the Mirrored Disks Set(s) section of this table • Two Ethernet Adapters that meet the requirements listed in the Ethernet adapter section of this table • Floppy disk drive • Monitor, keyboard, mouse, and video adapter Make sure your IOP systems conform with the requirements specified in the *Endurance Release Notes*. **No** IDE devices other than CD-ROMs may be present.

Table 1-2 Endurance Server Hardware Requirements (Continued)

Item	Notes
CEs	The two CEs must be identical Pentium class PCI-bus PCs. Each CE must have: • The capability of restarting automatically after a power failure. On some systems, you may need to select options for automatic restart in the system Setup utility. • Both CEs must have the same amount of RAM (256 MB minimum). • Floppy disk drive • Video adapter -- required for the CE to boot and for maintenance purposes. A standard PCI or AGP VGA-compatible video adapter provides the video BIOS required to boot the CE and display the following items: - POST messages - BIOS setup, test, and diagnostics - MS-DOS boot for flashing the MIC - Windows operating system flex-boot - Text phase of the Windows operating system boot • Monitor – used for running setup and diagnostics, flashing the MICs on the CEs, and maintenance purposes. • Keyboard – if your computer’s BIOS requires a keyboard to boot. Make sure your CE systems conform with the requirements specified in the *Endurance Release Notes*. You can use one monitor, keyboard, and mouse for the IOPs and CEs along with a keyboard, video, mouse (KVM) switch. For more information about using a switch as part of your hardware installation, see Appendix A.
Mirrored Disks Set(s)	Each Endurance server configuration must have at least one mirrored disk set (two disks, one on each IOP).

Table 1-2 Endurance Server Hardware Requirements (Continued)

Item	Notes
Ethernet Adapters	At least four Ethernet adapters, minimally: • Two Ethernet PCI adapters for the IOP Link (IL) connection (one per IOP). These adapters must be identical – the same manufacturer and model number. Cross-over cables are provided with the Endurance server kit. If your adapters require an alternative media type, be sure you acquire the appropriate cable. • Two Ethernet adapters (one per IOP) that support soft-settable Ethernet addresses to provide connectivity to your network. These adapters must be identical – the same manufacturer and model number. Refer to the HP Customer Support Web site for information about the cables and adapters you can use in your Endurance server.
2 or 3 blank diskettes	Use two diskettes to make the Emergency Repair diskettes (one for each IOP). If you choose to do so, you can also make an Endurance Configuration diskette.
Network cables to provide network connectivity	The cables must be compatible with the Ethernet adapters that you install.
Optional: 2 Uninterruptable Power Supplies	Use one UPS per tuple. The Endurance server has two tuples. Each tuple contains a CE, and IOP, and a network connection.

Software Requirements

Make sure that you have all of the following before starting to install the software:

Table 1-3 Endurance Server Software Requirements

Item	Notes
The Windows operating system	Refer to the *Endurance Release Notes* for the Windows operating systems on which the Endurance software can be installed.
One of the currently supported Windows operating system Service Packs	New Service Packs, when available from Microsoft, may require additional qualification from HP. For a complete list of supported Service Packs, see the *Endurance Release Notes.*
1 MS-DOS bootable diskette	

Table 1-3 Endurance Server Software Requirements (Continued)

Item	Notes
All device driver diskettes relating to your computers and adapters	For SCSI and Ethernet adapters, be sure to install the most current driver. For most adapters, the driver that is shipped with the adapter or that is packaged in the Windows operating system distribution kit is **not** the most current. One way to ensure you to obtain the most current driver is to download it from the manufacturer's web site. If you are not sure you have the latest driver, contact the manufacturer or your service provider for assistance. Make sure that you know the path to the `.INF` file on each driver diskette. Depending on the manufacturer, the driver might be located in a subdirectory on the manufacturer's diskette. For example, `a:\winnt\`.
1 MIC utilities diskette	Create this diskette using the instructions in *Chapter 7* of the *HP Netserver AA Solution Administrator's Guide*. Warning: Make sure that the version of MTCFLASH you use coincides with your hotfix level. If you have a hotfix that supersedes what is contained on the MIC utilities diskette you created, use the hotfix diskette to flash the MICs. In that case, do **not** use the MIC utilities diskette you created from the Endurance CD.

After reviewing the software installation requirements, read the *Endurance Release Notes* for the Endurance software that you are about to install.

Continue with *Planning the SCSI Disk and CD-ROM Configurations*.

Planning the SCSI Disk and CD-ROM Configurations

After ensuring that you have all needed components, you must determine the SCSI device configuration. You use this information when you configure the Endurance server software. Complete a SCSI Configuration Chart (Figure 1-3) for your Endurance server. Copy this chart if you need to complete more than one, which is necessary if you are using either:

- Multiple buses on a SCSI adapter
- Multiple SCSI adapters

A sample of a completed chart is shown in Figure 1-2.

SCSI Configuration Charts

Sample SCSI Configuration Chart

PCI or other PC Bus Slot number: 1

SCSI Adapter Number (Port Number)[1]: 0

SCSI Bus Number[1]: 0

SCSI ID[1,2]	Logical Unit No[1]	IOP1 Device	Disk Size	IOP2 Device	Disk Size
0[3]	0	`IOP1 Boot Disk`		`IOP2 Boot Disk`	
1[4]	0	`CE Boot Disk (Mirrored Disk Set 1)`		`CE Boot Disk (Mirrored Disk Set 1)`	
2	0	`Mirrored Disk Set 2`		`Mirrored Disk Set 2`	
3	0	`Mirrored Disk Set 3`		`Mirrored Disk Set 3`	
4	0	`CD-ROM`	`N/A`	`Must be unused`	`N/A`
5	0	`Must be unused`	`N/A`	`CD-ROM`	`N/A`
6	0	`Tape`	`N/A`	`Must be unused`	`N/A`
7	0	`Initiator ID`	`N/A`	`Initiator ID`	`N/A`
8		`unused`		`unused`	
9		`unused`		`unused`	
10		`unused`		`unused`	
11		`unused`		`unused`	
12		`unused`		`unused`	
13		`unused`		`unused`	
14		`unused`		`unused`	
15		`unused`		`unused`	

Note: Refer to the next page for notes and additional information.

Figure 1-2 Sample SCSI Configuration Chart

Notes for the Sample SCSI Configuration Chart

[1] This information is available in the active Windows Registry after you install all SCSI adapters and the Windows operating system drivers (`HKEY_LOCAL_MACHINE\HARDWARE\DEVICMAP\SCSI`).

[2] One SCSI ID (typically 7) is not available because the SCSI adapter uses it. To determine which SCSI ID is not available, check the adapter setup and identify the value of the `Initiator Id`. Note that you can reset or change the `Initiator Id` for an adapter, but it is **not** recommended unless you are doing this so that it matches its peer adapter on the other IOP. Check the adapter vendor's recommendations for this ID, or use SCSI ID 7 if possible. Note that SCSI ID and Target ID are equivalent in meaning.

[3] The IOP boot disk must be the first hard disk detected in the system configuration: lowest adapter number (determined by the BIOS), lowest SCSI ID. In a typical single SCSI adapter configuration, this is SCSI ID 0. Some SCSI adapters support booting from IDs other than the lowest.

[4] For the CE boot disk to map to the `c:` drive when the Endurance server is operational, the CE boot disk must be the first redirected hard disk detected in the configuration: lowest adapter number, lowest SCSI ID among redirected disk devices. In a typical (single SCSI adapter) configuration, this is SCSI ID 1.

Additional Notes:

- IOP boot disks are not redirected to CEs and should occupy the same SCSI address on both IOPs.
- CD-ROMS can be SCSI devices or IDE devices. All other storage devices (mirrored and non-mirrored) must be SCSI devices. No IDE devices other than CD-ROMs can be present in the IOPs. Note, however, that the Windows operating system treats IDE CD-ROMs like SCSI devices for configuration purposes.
- If you configure a non-mirrored device, the same corresponding SCSI address may not be in use on the other IOP (same adapter number).

SCSI Configuration Chart

SCSI Configuration Chart

PCI or other PC Bus Slot number:

SCSI Adapter Number (Port Number)[1]:

SCSI Bus Number[1]:

SCSI ID[1,2]	Logical Unit No[1]	IOP1 Device	Disk Size	IOP2 Device	Disk Size
0[3]					
1[4]					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Figure 1-3 SCSI Configuration Chart

Installing IDE CD-ROMS

You can install IDE CD-ROMs rather than SCSI CD-ROMs. If you install an IDE CD-ROM drive in one IOP, then you must also install an IDE CD-ROM drive in the other IOP. **No variation** on this hardware configuration is allowed.

Configure the IDE CD-ROM drive as necessary to be accessible by the Windows operating system. If your server requires it, make sure that the IOP can boot from the IDE CD-ROM. You can assign the IDE CD-ROM drive to the IOP operating system and not configure it as redirected. You can also use the Endurance Configuration Utility to configure the IDE CD-ROM drive for redirection, on either IOP1 or IOP2, but not on both.

If an IDE device malfunctions upon boot, the Windows operating system does not assign any SCSI resources to the IDE controller. Moreover, if no IDE devices are detected, the ATAPI driver is not loaded. This is different than SCSI devices, for which the Windows operating system loads the SCSI driver and assigns port numbers as long as a SCSI adapter is detected, even if no devices are attached to it.

Unless promptly repaired, an IDE CD-ROM failure results in different SCSI port number assignments for all physical Host Based Adapters (HBAs) upon rebooting the IOP. This invalidates the Endurance configuration for the IOP with the failed CD-ROM device, thus preventing it from joining with the other IOP. In that case, the failed component must be repaired before the IOP with the failed CD-ROM can return to active status.

Continue with *Unpacking Your Endurance Server Kit* (page 1-14).

Unpacking Your Endurance Server Kit

After *Planning the SCSI Disk and CD-ROM Configurations*, unpack your Endurance server kit and make sure that you receive:

Table 1-4 Endurance Server Kit Contents

Quantity	Part
4	MICs (Marathon Interface Cards)
4	MIC cables –2 local and 2 remote Two fiber optic cables are 5 meters, and two are 10 meters in length.
1	IL (IOP Link) cable – Category 5 UTP cross-over (Ethernet) cable for use in fast Ethernet connections, approximately 8 meters in length
1	IL (IOP Link) fiber – Multi-mode fiber for use in gigabit Ethernet, 8 meters in length Note: You use **either** of the above Ethernet connections, depending on whether you have fast Ethernet or gigabit Ethernet.
1	Endurance CD-ROM
1	Endurance documentation, including the *Endurance Release Notes*, *HP Netserver AA Solution Administrator's Guide*, and this manual
1	Endurance Accessory Kit that contains the labels for the Endurance server computers

Using the labels from the Endurance server kit, apply the appropriate labels to the monitors, front panels, and back panel of each IOP and CE.

Continue with *Completing Initial Power-On Self Test*.

Completing Initial Power-On Self Test

After *Unpacking Your Endurance Server Kit*, complete the following for each computer:

Step	Action	Notes
1	Make sure the power switches for the computer and monitor are *off*.	
2	Following the manufacturer's instructions, assemble each computer.	
3	Plug in the power cords.	To increase fault resiliency, install the computers of Tuple1 and Tuple2 on separate AC power circuits using Uninterruptable Power Supplies.
4	Power on each computer; make sure that it runs POST (power-on self test) and boots properly.	For the CEs, use a bootable floppy disk, and ensure that the CEs boot. For the IOPs, ensure that both IOPs can boot from their respective hard drives. If an operating system is not installed on the IOP, use the MS-DOS boot diskette.

Continue with Chapter 2, *Installing the Hardware*.

Installing the Hardware

2

This chapter describes how to install the Endurance server hardware. This chapter assumes that you are familiar with Endurance terminology (described in the *HP Netserver AA Solution Administrator's Guide*).

This chapter includes the following sections:

Installing the Adapters in the IOPs 2-2
Installing the Adapters in the CEs 2-4
Cabling the Endurance Server 2-6
Completing Hardware Installation 2-9

Installing the Adapters in the IOPs

After *Completing Initial Power-On Self Test*, install the Marathon Interface Card (MIC) adapters, Ethernet adapters, and SCSI adapters in each IOP.

> **Warning:** Make sure that both you and the computer are properly grounded, using, for instance, a wrist strap with an attached alligator clip that is connected to an appropriate ground.

Step	Action	Notes
1	Power off the IOP.	
2	Remove the cover of the IOP following the manufacturer's instructions.	
3	Install a MIC adapter in each IOP: a. Carefully remove the MIC from its anti-static packaging. b. Install the MIC into an available PCI slot.	The MIC has no onboard jumpers or switches. We recommend that MICs installed on IOPs be installed in the same slot. For example, install the MICs in slot 1 on both IOP1 and IOP2. We recommend that MICs do not share IRQs with other PCI devices, and whenever possible, you should install MICs in a primary PCI bus. We recommend that MICs and network cards not be plugged in the same PCI bus as a SCSI RAID controller.
4	Install the Ethernet adapters if not already installed.	Each IOP must have at least two, and may have up to five, Ethernet adapters to support: • An Ethernet PCI adapter for the IL connection. • An Ethernet adapter to provide connectivity to your network. These adapters must meet the requirements described in *Ethernet Adapters* on page 1-8. Ethernet adapter teaming and fault tolerance (AFT) are not supported. Make sure that you follow any installation requirements imposed by the manufacturer. For example, some adapter drivers must have a unique IRQ.

Step	Action	Notes
5	Install the SCSI adapters.	If the SCSI adapter was not delivered already installed in your computer, using the information that you recorded on the *SCSI Configuration Chart*, install and configure the SCSI devices following the manufacturer's directions. Make sure that you follow any installation requirements imposed by the manufacturer. For example, some adapters must have a unique IRQ.
6	Replace the cover.	
7	Power on the IOP.	
8	If the following BIOS options are available for your SCSI adapter, ensure that: • Extended BIOS translation is enabled for the SCSI adapter. • BIOS support for Int13 extensions is enabled for the SCSI adapter. • Host Adapter BIOS is loaded. • **Scan BIOS on Boot** is enabled only for the CE boot disk and the IOP boot disk.	
9	Specify the identity of the MIC.	The MIC BIOS Utility starts automatically because the MIC does not have an identity setting. Refer to Chapter 7 in the *HP Netserver AA Solution Administrator's Guide*. Specify IOP1 or IOP2 to correspond with the intended role of the IOP you are building.
10	Insert the MIC utilities diskette in the floppy drive, and restart the IOP.	For information about the MIC utilities diskette, see page 1-9.
11	Run MTCFLASH to update the MIC firmware: type `MTCFLASH -f`.	Warning: Once you start MTCFLASH, it must run to completion without interruption. For more information about this utility, refer to Chapter 7 of the *HP Netserver AA Solution Administrator's Guide*.
12	Remove the MIC utilities diskette.	

Continue with *Installing the Adapters in the CEs*.

Installing the Adapters in the CEs

After *Installing the Adapters in the IOPs*, install a MIC adapter in **each** CE.

Warning: Make sure that both you and the computer are properly grounded, using, for instance, a wrist strap with an attached alligator clip that is connected to an appropriate ground.

Step	Action	Notes
1	Power off the CE.	
2	Remove the cover of the CE following the manufacturer’s instructions.	
3	Install a MIC adapter in each CE: a. Carefully remove the MIC from its anti-static packaging. b. Install the MIC into an available PCI slot.	The MIC has no onboard jumpers or switches. **MICs installed on CEs must be installed in the same slot location**. For example, install the MICs in slot 1 on both CE1 and CE2. They must also have the same IRQ and use the same PCI resources. You should install the MIC in a primary PCI bus slot whenever possible.
4	Remove all devices except the keyboard, video adapter, and floppy drive.	The initial installation of the CE software requires a mouse.
5	Replace the cover of the computer.	
6	Power on the CE.	
7	Disable any disks in the computer except for the floppy drive.	Usually this is a 3.5’’ floppy drive. Refer to the manufacturer’s setup documentation for information. Make sure that only the following devices are enabled in the CMOS: • Video adapter • Keyboard • Mouse for the initial CE installation • 3.5’’ floppy drive Permanently disable or remove all other devices.
8	Use the BIOS setup utility to disable all on-board SCSI, Ethernet, and IDE controllers, parallel ports, COM ports, and USB.	

Step	Action	Notes
9	Specify the identity of the MIC.	The MIC BIOS Utility starts automatically whenever the MIC does not have an identity setting. Refer to Chapter 7 in the *HP Netserver AA Solution Administrator's Guide*. Specify CE1 or CE2 to correspond with the intended role of the CE you are building.
10	Insert your MIC utilities diskette in the floppy drive, and restart the CE.	
11	Run MTCFLASH to update the MIC firmware: type **`MTCFLASH -f`**.	Warning: Once you start MTCFLASH, it must run to completion without interruption. For more information about this utility, refer to Chapter 7 of the *HP Netserver AA Solution Administrator's Guide*.
12	Remove the MIC utilities diskette.	

Continue with *Cabling the Endurance Server*.

Cabling the Endurance Server

After *Installing the Adapters in the CEs*, connect the cables:

Step	Action	Notes
1	Remove the plugs from the cable sockets on the MIC and the protective covers from the cables.	
2	Connect the cables supplied in the Endurance kit.	See Table 2-1. When attaching MIC cables, firmly seat the connectors, and push the cable assembly in firmly until it locks with a slight click. Make sure that the CEs and IOPs are powered on and the cable ends are plugged in. Then verify that the LED adjacent to each connector transitions to green.
3	Cable your network connection to **each** IOP: a. Attach an Ethernet cable (that you provide) to the IOP's network adapter. b. Connect the cable to your network connection.	Both IOPs must be directly connected to the same local area network. Make sure the Ethernet cable is: • Compatible with the network cards that are in use in IOP1 — 100 BASE-T (Twisted Pair) or 1.0 Gigabit (Fiber or Twisted Pair). • The proper electrical specification (for example, category 5 if 100 BASE-T). If a smart HUB or Ethernet Switch is being used as the Endurance server Ethernet rail connection point: • At the switch configuration level, enable "Spanning Tree Protocol," or the equivalent 802.1d bridging protocol feature on each port that will be connected to the Endurance server. • Set the correct port speed and duplex mode (example 100Mbs/Full duplex) for each port that will be connected to the Endurance server. Do not select any Auto-detection settings. • If a "Fast Start" or equivalent parameter is available, enable this feature for each port that will be connected to the Endurance server. This minimizes potential delays in Ethernet fail-over performance.

Table 2-1 Endurance Server Cables

Cable	Description	Connects	Installation Instructions
MIC Cables	2 local fiber optic cables 2 remote fiber optic cables **Note:** The 5 meter cables are intended for local use, while the 10 meter cables are intended for remote use. However, the cables are interchangeable if distance is not an issue.	IOP1 to CE1	1. Attach a cable connector to the IOP1 port labeled LOCAL. 2. Attach the other end of the cable to the LOCAL port on CE1.
		IOP2 to CE2	1. Attach a cable connector to the IOP2 port labeled LOCAL. 2. Attach the other end of the cable to the LOCAL port on CE2.
		IOP1 to CE2	1. Attach a cable connector to the IOP1 port labeled REMOTE. 2. Attach the other end of the cable to the REMOTE port on CE2.
		IOP2 to CE1	1. Attach a cable connector to the IOP2 port labeled REMOTE. 2. Attach the other end of the cable to the REMOTE port on CE1.
IL Cable	Category 5 UTP cross-over (Ethernet) cable OR Fiber (gigabit Ethernet) cable	IL Ethernet adapters on IOP1 and IOP2	1. Attach one end of the cable to the IL Ethernet adapter port on IOP1. 2. Attach the other end of the cable to the IL Ethernet adapter port on IOP2. Use the appropriate cable, depending on the type of IL Ethernet adapter you have. Be sure to connect the adapters that support the IL and **not** the adapters that connect your server to the network.

Figure 2-1 is a cabling example of the Endurance server. The figure includes monitors and keyboards attached to the CE, which is an optional configuration.

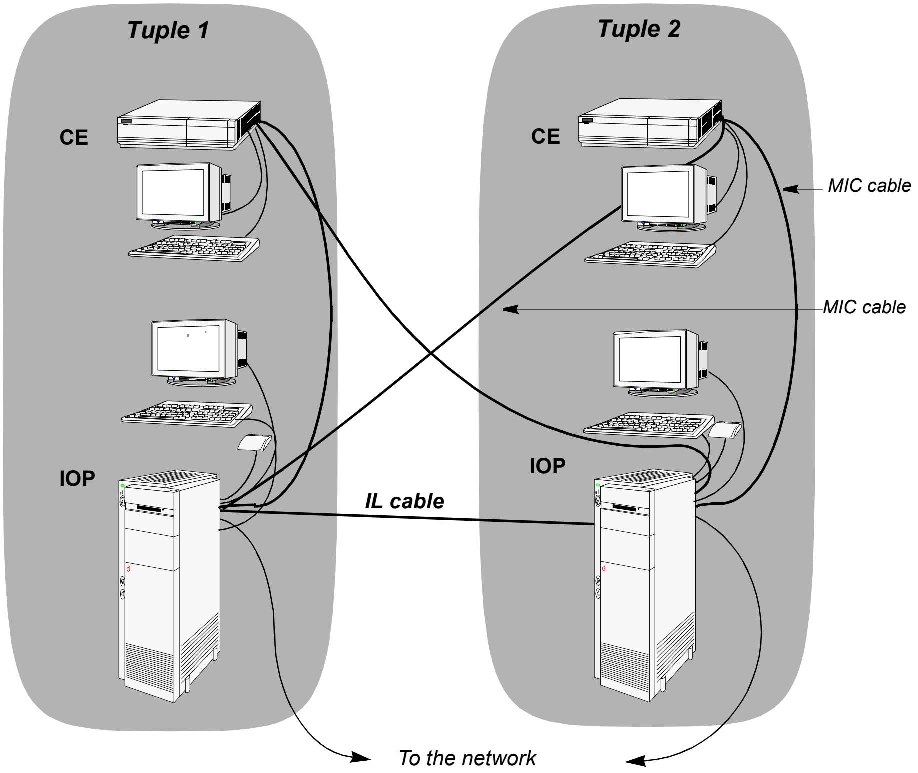


Figure 2-1 Endurance Server Cabling

For information about cabling the Endurance server with a KVM switch, see Appendix A.

Continue with *Completing Hardware Installation*.

Completing Hardware Installation

To complete the hardware installation:

Step	Action	Notes
1	Power on the CEs and IOPs.	
2	Verify that the MIC hardware is operating properly by running the MIC Client and Server Connectivity Tests from the MIC BIOS Utility on each IOP and CE.	Depending on the distance between the tuples, completing these tests may require two people, one at each tuple. You need a keyboard and monitor on the IOP and the CE to run tests in the MIC BIOS Utility. For MIC BIOS Utility information, refer to Chapter 7 of the *HP Netserver AA Solution Administrator's Guide*.

Continue with Chapter 3, Installing Windows and the Endurance Software.

Installing Windows and the Endurance Software

3

This chapter describes how to install the software for your Endurance server running the Windows operating system. This chapter assumes that you are familiar with the Windows operating system and Endurance terminology and describes only the Endurance-specific information related to installing and configuring Windows. For detailed Windows operating system information, refer to the Windows documentation.

To complete the software installation for the Endurance server, you must install both Windows and Endurance software as described in the following sections:

Overview of Endurance Installation 3-2

Installing Windows and Endurance Software on the IOPs 3-3

Installing Windows and Endurance Software on the CE 3-23

Installing the Endurance Manager on a Remote Client 3-34

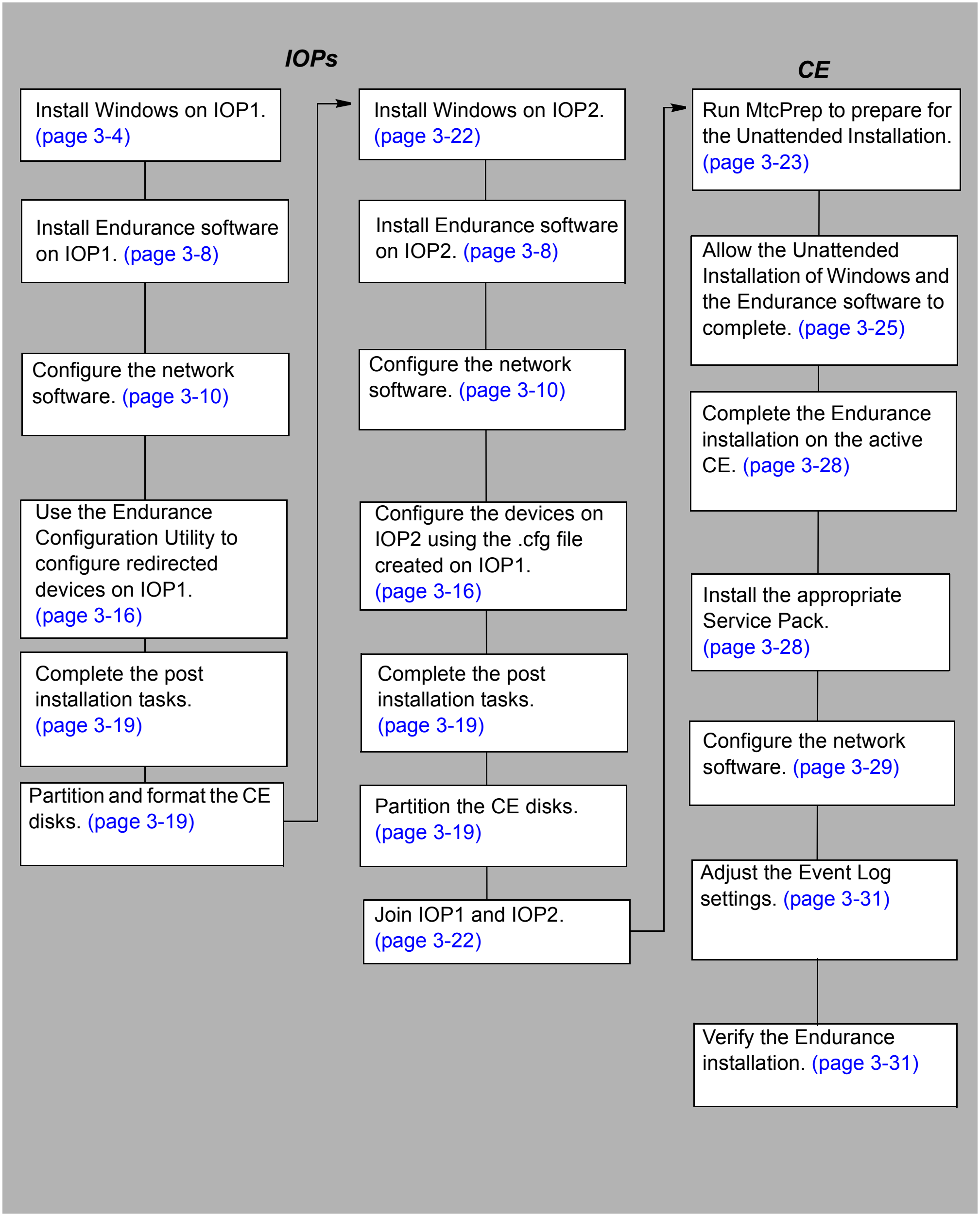
Microsoft provides the capability to pre-apply Service Packs to the original Windows distribution. This process is called Slip Streaming of Service Packs, and is explained by a document on the Windows distribution media located at:

`support\tools\spdeploy.doc`.

In addition to working with standard Windows distribution kits, the Endurance installation will work using kits prepared in this manner.

Overview of Endurance Installation

To complete an Endurance installation, you will follow this basic procedure:



Install Windows on IOP1. (page 3-4)

Install Endurance software on IOP1. (page 3-8)

Configure the network software. (page 3-10)

Use the Endurance Configuration Utility to configure redirected devices on IOP1. (page 3-16)

Complete the post installation tasks. (page 3-19)

Partition and format the CE disks. (page 3-19)

Install Windows on IOP2. (page 3-22)

Install Endurance software on IOP2. (page 3-8)

Configure the network software. (page 3-10)

Configure the devices on IOP2 using the .cfg file created on IOP1. (page 3-16)

Complete the post installation tasks. (page 3-19)

Partition the CE disks. (page 3-19)

Join IOP1 and IOP2. (page 3-22)

Run MtcPrep to prepare for the Unattended Installation. (page 3-23)

Allow the Unattended Installation of Windows and the Endurance software to complete. (page 3-25)

Complete the Endurance installation on the active CE. (page 3-28)

Install the appropriate Service Pack. (page 3-28)

Configure the network software. (page 3-29)

Adjust the Event Log settings. (page 3-31)

Verify the Endurance installation. (page 3-31)

Installing Windows and Endurance Software on the IOPs

You install software on the IOPs by:

- *Installing Windows on the IOPs*
- *Installing Endurance Software on the IOPs*
- *Completing the IOP Installation*

Installing Windows on the IOPs

Before you begin, verify that the CE boot disks on the two IOPs are the same size. If the CE boot disk on one IOP is smaller than that on the other IOP, consider the IOP with the smaller CE boot disk IOP1 and begin installing your software there. Consider the other IOP, IOP2. When the installation is complete, and the initial mirror copy is in progress, it copies from the smaller disk, which should be IOP1, to the larger disk, IOP2.

Complete all procedures in this chapter in the order that they are documented.

Install Windows on the IOPs using one of the operating systems listed in the *Endurance Release Notes*.

Step	Action	Notes
1	Start the Windows Setup, following the manufacturer's instructions.	
2	Complete the Windows installation to meet the requirements of your site, using the following guidelines.	These guidelines describe the tasks that you must perform during the Windows installation for Endurance IOP installation. If you need detailed Windows installation information, refer to the Windows documentation.
	Windows Installation Guidelines for the Endurance IOPs	
	Have available the latest drivers for the Ethernet adapters.	
	Check with your service provider for the latest supported SCSI device driver for your SCSI adapter.	Windows should autodetect all SCSI drivers. If you need additional SCSI drivers, you should download them from the manufacturer's web site.
	When prompted for the disk partition where you want to install Windows: • Create the IOP's boot partition of 1.5 gigabytes or larger. • When you partition the IOP boot device, reserve 1.5 gigabytes of unpartitioned space at the end of the disk for future use. • Install the IOP Windows root in the first partition.	Refer to Figure 3-6 for an example of a properly partitioned disk. • Be sure that you select the IOP boot disk. • Also be aware that you **cannot** change the boot drive letter once assigned.
	Select **NTFS** as the file system format for the IOP boot disk.	NTFS is mandatory on all disks in the Endurance server.
	During network setup, include the IOP number in the computer name.	For example, *NAME*_IOP1
	When configuring network adapters, be sure to configure the Ethernet adapters that service the IL to 100 Mbps or gigabit and **Full Duplex**.	
	Do **not** install Microsoft Internet Information Server on the IOP.	This application is not supported on an IOP.
	Specify the correct time for your computer.	All Endurance server computers must use the same time zone and daylight saving time option. Later, when installing software on the CEs, the time for the CEs is set to the time zone you specified for the IOPs.

Step	Action	Notes
3	Reboot the computer.	A Windows Configure Your Server screen appears. • Select the **Configure This Server Later** option. • Click **Next**. • Uncheck the option Show This Screen At Startup. • Dismiss the screen.
4	Dismiss the Hardware Installation Wizard.	The Hardware Installation Wizard reports it detected the IOP MIC as a mass storage controller. You will install the MIC driver later, during the Endurance software installation on the IOP.
5	Install one of the currently supported Windows Service Packs and any applicable Microsoft hotfixes.	For a complete list of supported Service Packs, refer to the *Endurance Release Notes*. If you used slip streaming, ignore this step.
6	Using the Backup utility, create an Emergency Repair Diskette.	• Click **Start** ➔ **Programs** ➔ **Accessories** ➔ **System Tools** ➔ **Backup.** • In the Backup Utility, click the button for the ERD, and enable **Backup Registry to Repair Directory**.

Setting the Video Display Properties

For convenience and best performance, set the video properties on the IOP. Among the ways to access video properties, you can either:

- Click **Start** ➔ **Settings** ➔ **Control Panel** ➔ **Display** ➔ **Settings** tab on the Display Properties Window

  or

- Right click with the cursor located in the middle of the screen and click **Properties.**

Set video and monitor resolutions to values that are supported by your video card and monitor:

- Number of colors – Color must be set to High Color or 16 bit (must be greater than 256 colors).
- Screen Area: 1024 X 768, or your personal preference.
- Refresh rate: 72 Hz or better, or your personal preference. (Click on **Advanced**, and then select the **Monitor** tab to access the Refresh rate field.)

Continue with *Installing Endurance Software on the IOPs*.

Installing Endurance Software on the IOPs

After installing Windows on IOP1, install the Endurance software on IOP1. After you complete the installation of Endurance software on IOP1, install the Windows and Endurance software on IOP2.

Step	Action	Notes
1	Insert the Endurance CD in the CD-ROM drive of IOP1. At the top level of the CD, navigate to and double-click on `Setup.exe` to start the installation procedure.	
2	Follow the instructions displayed on the screen.	
3	When asked to choose the type of setup, select **Endurance Setup** and **Online Documentation**.	During the Endurance system setup portion of the installation: • Type the kit license number, which is located on the back of the Endurance CD jewel case. • Select **IOP1** (or **IOP2** as appropriate) as the location in which to install Endurance software. The Endurance Setup includes the installation of the Endurance Manager. During the online documentation portion of the installation, install Adobe Acrobat Reader if it is not already installed on your system. The Endurance installation detects whether the Adobe Acrobat Reader is installed. If it is already installed, this option is displayed without a check mark. We recommend installing and reading the online documentation on the IOPs.
4	When prompted to restart the computer, reboot the IOP in *Offline Endurance I/O Processor Mode*.	

Continue with *Enabling NetBEUI.*

Enabling NetBEUI

For maintenance purposes, you can enable a networking protocol for communication between the IOPs (IL adapter), or an IOP and a CE (Virtual Network adapter). NetBEUI is adequate for this purpose. If you do not want to use NetBEUI, use TCP/IP for this purpose.

By default, the Windows installation only installs the TCP/IP protocol. In order to use NetBEUI over the IOP Link or Virtual Network, you must install it. If you do not want to use NetBEUI, do not install it.

To install NetBEUI, follow these steps:

Step	Action
1	Right click on **My Network Places** on the desktop, and select **Properties**.
2	Right click on any configured adapter, and select **Properties**.
3	Click **Install**, **Protocol**, **Add**, then select **NetBEUI**.

Continue with *Installing Network Software on the IOPs*.

Installing Network Software on the IOPs

Before you begin to install network software on the IOPs, rename all network adapters to correspond to their function in the Endurance server. Later, when configuring Ethernet adapters, this will make it easier for you to select the desired adapters from a list.

To rename your adapters, on the Network and Dial-up Connection screen, right click on each adapter, and rename it. We recommend the following names:

Connection Name	Description	Notes
• IL adapter	for the adapter that services the IOP Link	
• Redirected Ethernet adapter 1	for all Ethernet adapters that provide public LAN connectivity for the CEs	There can be up to four redirected Ethernet adapters. Name them as shown, consecutively: 1,2,3, and 4.
• Virtual Network adapter IOP1	for the Virtual LAN between the IOP and CEs	Name the Virtual Network adapter in IOP1 as shown. Replace IOP1 with IOP2 in the name for the Virtual Network adapter in IOP2.
• IOP Ethernet adapter	for any network adapter not configured for the IL or as a redirected adapter	

To install network software:

Step	Action	Notes
1	Install the Endurance Virtual Network Provider as a network adapter using the Add New Hardware Wizard. a. Using the Control Panel, start the Add/Remove Hardware Wizard. b. Click **Add/Troubleshoot a device**. c. Select **Add a new device**. d. Select **No, I want to select the hardware from a list.** e. Select **Network adapters**, then **Have Disk**. f. Browse to `drive\folder\system32\drivers\MtcPnP` to add the service: **Service** **File** Endurance Virtual Network Provider (MtcVnP) `netmtcvnp.inf` The wizard completes the installation of the Virtual Network Provider. Note: Ignore the warning `Digital Signature Not Found`, and continue the installation.	`drive\folder` is the drive and folder where you installed the IOP root. (You can find this in the `%SystemRoot%` environment variable. For example, `C:\WINNT`
2	Install the Endurance network services. a. Right click on **My Network Places** on the desktop, then select **Properties**. b. Right click on any configured adapter, and select **Properties**. c. Click **Install**, **Service**, **Add**, then **Have Disk**. d. Browse to `drive\folder\system32\drivers\MtcPnP` to add the services: **Service** **File** Endurance Datagram Service (MtcDgs `netmtcdgs.inf` Endurance Ethernet Provider (MtcEthP `netmtcethp.inf` Endurance IOP Link Driver (MtcEtx `netmtcetx.inf`	After installing the first service, repeat steps C and D two more times to install the other two services.
3	Adjust the network bindings: a. From the Properties page, select each adapter, then **Properties**. b. Using the check boxes, make the necessary adjustments for the network bindings. See Table 3-1.	

Table 3-1 Network Adapter Bindings

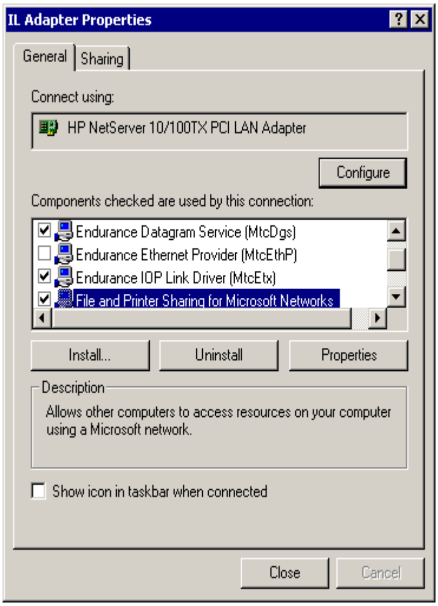
Adapter	Description	Binding Configuration
IOP Link Adapter (IL)	The Ethernet adapter that services the IOP Link and provides private network connectivity between the IOPs.	**Enable** - *Endurance IOP Link Driver* - *Endurance Datagram Service* - *NetBEUI* or *TCP/IP* For the TCP/IP protocol, you must specify the IP addresses because there is no DHCP server. - *Client for Microsoft Networks* - *File and Printer Sharing for Microsoft Networks* **Disable** - *Endurance Ethernet Provider* See Figure 3-1. Be sure the Ethernet adapters that service the IL are configured to 100 Mbps or gigabit and Full Duplex.
Redirected Ethernet adapter	Any Ethernet adapters that provide LAN connectivity for the CEs.	**Enable** - *Endurance Ethernet Provider* - *Endurance Datagram Service* **Disable** - *IOP Link Driver* - All other services and protocols See Figure 3-2.

Table 3-1 Network Adapter Bindings (Continued)

Adapter	Description	Binding Configuration
Endurance Virtual Network Provider (MtcVnP)	Virtual LAN between the IOP and the CEs which provides a private point-to-point network.	**Enable** - *NetBEUI* or *TCP/IP* For the TCP/IP protocol, you must specify the IP addresses because there is no DHCP server. - *Client for Microsoft Networks* - *File and Printer Sharing for Microsoft Networks* **Disable** - *Endurance IOP Link Driver* - *Endurance Ethernet Provider* - *Endurance Datagram Service* See Figure 3-3.
IOP Ethernet adapter	Any network adapter that is not configured for the IOP Link (IL) or as a redirected adapter.	**Enable** - *Endurance Datagram Service* - *NetBEUI or TCP/IP* - *Client for Microsoft Networks* - *File and Printer Sharing for Microsoft Networks* **Disable** - *Endurance Ethernet Provider* - *IOP Link Driver* See Figure 3-4.

Note: You can bind MtcDgs to a maximum of five Ethernet adapters.

Figure 3-1, Figure 3-2, Figure 3-3, and Figure 3-4 provide examples of the adapter binding configurations.


IL Adapter Properties

General | Sharing

Connect using:

HP NetServer 10/100TX PCI LAN Adapter

Components checked are used by this connection:

☑ Endurance Datagram Service (MtcDgs)
☐ Endurance Ethernet Provider (MtcEthP)
☑ Endurance IOP Link Driver (MtcEtx)
☑ File and Printer Sharing for Microsoft Networks

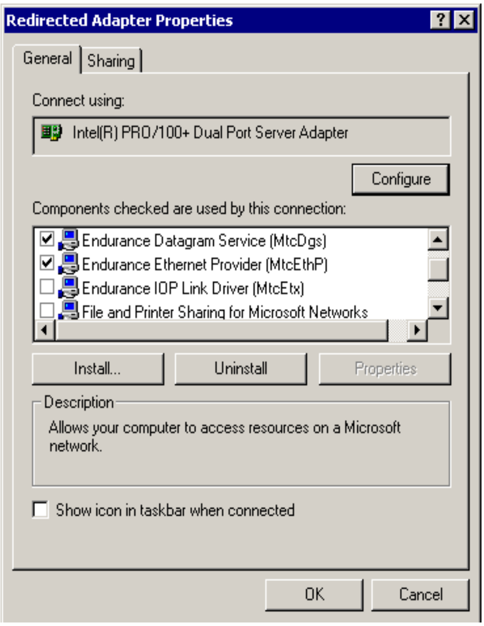
Description

Allows other computers to access resources on your computer using a Microsoft network.

☐ Show icon in taskbar when connected

- ✔ *Endurance IOP Link Driver*
- *Endurance Ethernet Provider*
- ✔ *Endurance Datagram Service*
- ✔ *NetBEUI or TCP/IP*
- ✔ *Client for Microsoft Networks*
- ✔ *File and Printer Sharing for Microsoft Networks*

Figure 3-1 IL Adapter Bindings


Redirected Adapter Properties

General | Sharing

Connect using:

Intel(R) PRO/100+ Dual Port Server Adapter

Components checked are used by this connection:

☑ Endurance Datagram Service (MtcDgs)
☑ Endurance Ethernet Provider (MtcEthP)
☐ Endurance IOP Link Driver (MtcEtx)
☐ File and Printer Sharing for Microsoft Networks

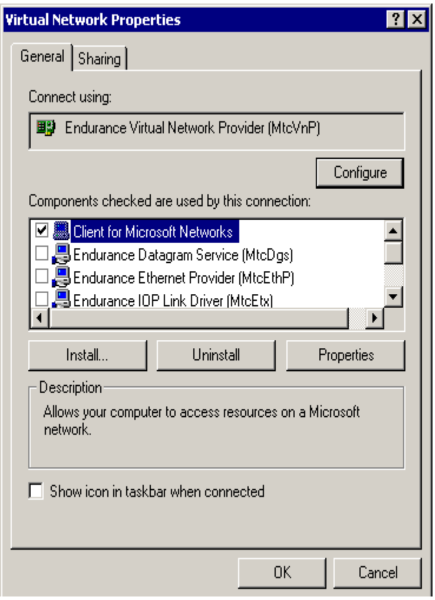
Description

Allows your computer to access resources on a Microsoft network.

☐ Show icon in taskbar when connected

- *Endurance IOP Link Driver*
- ✔ *Endurance Ethernet Provider*
- ✔ *Endurance Datagram Service*
- *NetBEUI and TCP/IP*
- *Client for Microsoft Networks*
- *File and Printer Sharing for Microsoft Networks*

Figure 3-2 Redirected Ethernet Adapter *n* Bindings



Connect using:

Endurance Virtual Network Provider (MtcVnP)

Components checked are used by this connection:

☑ Client for Microsoft Networks
☐ Endurance Datagram Service (MtcDgs)
☐ Endurance Ethernet Provider (MtcEthP)
☐ Endurance IOP Link Driver (MtcEtx)

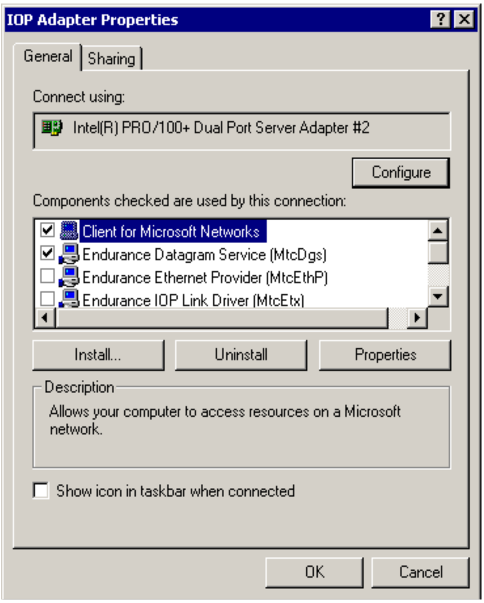
Description

Allows your computer to access resources on a Microsoft network.

☐ Show icon in taskbar when connected

  Endurance IOP Link Driver
  Endurance Ethernet Provider
  Endurance Datagram Service
✔ NetBEUI or TCP/IP
✔ Client for Microsoft Networks
✔ File and Printer Sharing for Microsoft Networks

Figure 3-3 Virtual Network Provider Adapter IOP1 Bindings



Connect using:

Intel(R) PRO/100+ Dual Port Server Adapter #2

Components checked are used by this connection:

☑ Client for Microsoft Networks
☑ Endurance Datagram Service (MtcDgs)
☐ Endurance Ethernet Provider (MtcEthP)
☐ Endurance IOP Link Driver (MtcEtx)

Description

Allows your computer to access resources on a Microsoft network.

☐ Show icon in taskbar when connected

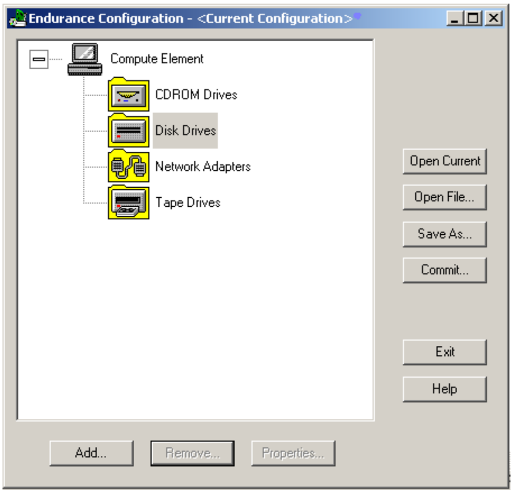
  Endurance IOP Link Driver
  Endurance Ethernet Provider
✔ Endurance Datagram Service
✔ NetBEUI or TCP/IP
✔ Client for Microsoft Networks
✔ File and Printer Sharing for Microsoft Networks

Figure 3-4 IOP Ethernet Adapters

Continue with *Using the Endurance Configuration Utility to Configure Redirected Devices*.

Using the Endurance Configuration Utility to Configure Redirected Devices

To configure the redirected devices, follow these steps:

Step	Action	Notes
When configuring IOP1:		
1	Click **Start** → **Programs** → **Marathon Endurance** → **Endurance Configuration Utility**.  Endurance Configuration - <Current Configuration> Compute Element CDROM Drives Disk Drives Network Adapters Tape Drives Open Current Open File... Save As... Commit... Exit Help Add... Remove... Properties... **Figure 3-5 Endurance Configuration Utility**	For detailed information about using the Endurance Configuration Utility, see Chapter 6 in the *HP Netserver AA Solution Administrator's Guide*.
2	Use the Endurance Configuration Utility to define all devices that will be redirected from the IOPs to the CE.	The Endurance configuration data for both IOPs must be **identical** except for Ethernet addresses. To properly define your configuration, you must define all devices that are available to the CE operating system. This includes mirrored disk sets (two disks containing identical data and residing on separate IOPs), non-mirrored devices (tape drives, CD-ROM drives, or non-mirrored disks) from both IOP1 and IOP2, and network adapters.

Step	Action	Notes
	Endurance Configuration Guidelines	
3	For disks: 1. Select a component. 2. Click **Add**. 3. Select the appropriate option for the device you are adding: • Non-mirrored on IOP1 • Non-mirrored on IOP2 • Mirrored (the default) 4. From the list, select the SCSI device you want to configure. Then follow the displayed instructions. For other devices, such as redirected Ethernet adapters: 1. Select a component. 2. Click **Add**. 3. Repeat this procedure for each device you want to add, including CD-ROMs, network adapters, and tape drives.	Make sure you add all devices that you want to be available from the CE (including the non-mirrored devices on both IOP1 and IOP2). A minimal configuration includes one mirrored disk set (that contains the CE boot partition). When configuring the CE's boot disk, which must be a mirrored disk, be sure to check the **Boot** option on the Confirm Add SCSI Screen. (This box is grayed out for any device that is not a valid boot device.) A minimal configuration includes one redirected Ethernet adapter.
	Optionally, you can identify a CD-ROM drive for use by the CE.	You can redirect a CD-ROM drive for direct use from the CE, or alternatively, you can access it over the Virtual Network. Warning: A maximum of one IDE CD-ROM drive from one of the IOPs can be redirected.
	After configuring all devices, select **Commit**.	This saves the configuration changes. If you exit the Configuration Utility without clicking Commit, your configuration is **not** saved.
	After committing the configuration, select **Save As,** and save the configuration to a file which you can use to configure the Endurance software on IOP2.	You can transfer the file over the IL after both IOPs are running.

Step	Action	Notes
Only when configuring IOP2:		
1	Click **Start** → **Programs** → **Marathon Endurance** → **Endurance Configuration Utility**.	The steps in this section apply only to configuring IOP2. They are **not** performed when configuring IOP1.
2	Use the Configuration Utility to specify IOP2 Ethernet addresses instead of IOP1, and configure the network adapters. Optionally, you can open the Configuration file you saved from IOP1 to configure devices on IOP2: 1. Select **Network Adapters**. 2. From the list, select the Ethernet adapter you want to configure. 3. Click **Remove** to delete the Ethernet adapter address on IOP1. 4. Click **Add**, and select the appropriate adapter on IOP2. 5. Repeat this procedure for each entry you see under Network Adapters in the Endurance Configuration Utility. 6. Select **Commit**.	Except for the Ethernet addresses, on each IOP the configuration files must be **identical**; otherwise, the IOPs fail to join, and the CEs cannot be booted.

Continue with *Completing the IOP Installation*.

Completing the IOP Installation

The following tasks complete the software installation on the IOPs:

- *Creating an Emergency Repair Diskette*
- *Partitioning and Formatting the CE Boot Disk*
- *Verifying the Proper Configuration of the IOP Link Adapters*
- *Installing Software on IOP2*

Creating an Emergency Repair Diskette

Use the Backup utility to create an Emergency Repair Diskette:

- Click **Start** ➝ **Programs** ➝ **Accessories** ➝ **System Tools** ➝ **Backup.**
- In the Backup Utility, click the button for the ERD and enable **Backup Registry to Repair Directory**.

Continue with *Partitioning and Formatting the CE Boot Disk.*

Partitioning and Formatting the CE Boot Disk

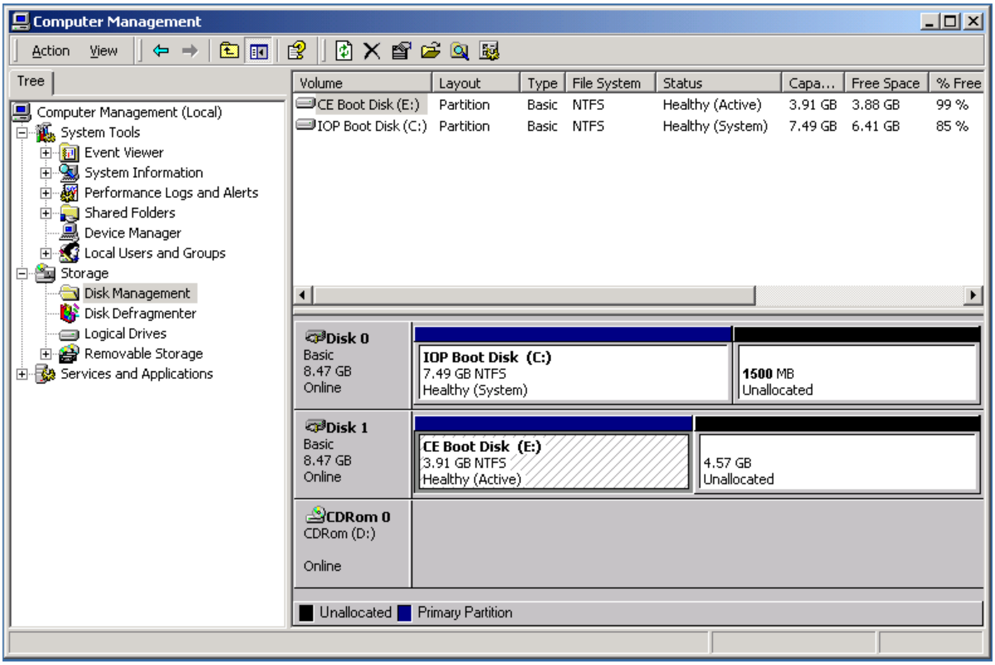
You must partition and format the CE boot device on both IOP1 and IOP2. It is not necessary to partition and format the CE non-boot devices on the IOPs; you can partition and format them later from the CE after the CE is installed and booted.

> **Note:** You must be in *Offline Endurance I/O Processor Mode* to access the CE disks from an IOP.

To partition and format the CE boot disk, follow these steps:

Step	Action	Notes
1	Run the Disk Management application.	To do so, right click on **My Computer** on the desktop; select **Manage;** click **Disk Management** in the console tree under **Storage**. The Computer Management view appears in the right-hand pane. See Figure 3-6.
2	If the **Write Signature and Upgrade Disk Wizard** appears, dismiss it by clicking **Cancel**.	New disks or disks that have had a low level SCSI format performed cause a prompt to write a signature.

Step	Action	Notes
3	If a red circle with a minus sign appears superimposed on a disk icon, complete these steps: a. Right click on the red circle, and select **Write Signature**. b. Click the check box for all disks that require a signature. c. Click **OK**. d. Verify that the red circle has cleared and that the word **Basic** appears under the disk icon(s).	Only Basic Disks are supported for CE boot devices.
4	Create and format the partition(s): a. Right click on an unallocated space. b. Select **Create Partition**. The **Create Partition Wizard** runs. c. Follow the instructions on the screen, making sure that the CE boot partition **does not** exceed 4000 MB and that you select the **NTFS** file system (the default). Also be sure you select **Primary Partition** for the CE boot partition.	• **NTFS is the only supported file system.** • **Due to limitations in some SCSI controllers, the maximum supported size for the CE boot partition is 4000 MB.** • When formatting, assign a descriptive label to the partition. For example, for the CE boot partition, assign a label such as `CE_Boot`.
5	Right click on the CE boot partition, and select **Mark Partition Active**.	You must complete this step for the CE boot partition to be a bootable partition.
6	See Figure 3-6 for an example of properly partitioned disks.	



Volume	Layout	Type	File System	Status	Capa...	Free Space	% Free
CE Boot Disk (E:)	Partition	Basic	NTFS	Healthy (Active)	3.91 GB	3.88 GB	99 %
IOP Boot Disk (C:)	Partition	Basic	NTFS	Healthy (System)	7.49 GB	6.41 GB	85 %

Disk	Partition	Unallocated
Disk 0 Basic 8.47 GB Online	**IOP Boot Disk (C:)** 7.49 GB NTFS Healthy (System)	**1500** MB Unallocated
Disk 1 Basic 8.47 GB Online	**CE Boot Disk (E:)** 3.91 GB NTFS Healthy (Active)	4.57 GB Unallocated
CDRom 0 CDRom (D:) Online		

Figure 3-6 Example of Properly Partitioned Disks

Continue with *Verifying the Proper Configuration of the IOP Link Adapters*.

Verifying the Proper Configuration of the IOP Link Adapters

Verify that when you configured the network adapters, the Ethernet adapters that service the IL are configured to 100 Mbps or gigabit and **Full Duplex**.

Continue with *Installing Software on IOP2*.

Installing Software on IOP2

To install the Windows and Endurance software on IOP2:

Step	Action	Notes
1	Return to Step 1 in the section *Installing Windows on the IOPs* on page 3-4.	
2	Complete all the included tasks through *Verifying the Proper Configuration of the IOP Link Adapters* on page page 3-21.	Substitute references to IOP1 with IOP2 when completing these tasks.

Continue with *Ensuring that IOP1 and IOP2 Join*.

Ensuring that IOP1 and IOP2 Join

After completing all installation tasks for IOP1 and IOP2, ensure that the IOPs join.

Step	Action	Notes
1	Boot both IOPs in *Operational Endurance I/O Processor Mode*.	
2	Click **Start** → **Programs** → **Marathon Endurance** → **Endurance Manager**, and use the Endurance Manager on IOP1 to make sure both IOPs and all IOP devices come *online*.	• Network rails are dark green. • Disk sources of mirror copies are light green. • Disk targets of mirror copies are yellow.

Continue with *Installing Windows and Endurance Software on the CE*.

Installing Windows and Endurance Software on the CE

After completing the IOP software installation, install Windows and Endurance software on the CE by:

- Installing the Software on the CE
- *Completing the Unattended Installation*
- *Completing Software Installation on the CEs*

Installing the Software on the CE

Before you begin to install software on the CE:

- Attach a local keyboard, mouse, and monitor to the CE. You may need to use these if problems are detected during the Unattended Installation.
- Installation of Windows and Endurance software on the CE is accomplished by the Windows Unattended Installation. For this automatic installation, you must supply several settings, such as:
  - The Windows license type:
    - Per server. If per server, indicate the number of auto users.
    - Per seat
  - The computer name
  - The user name
  - The organization name
  - The Windows product ID

  Note: If you are slip streaming the CE's Service Pack, before installing Windows on the CE, refer to the Microsoft documentation about slip streaming the Service Pack for information about preparing the Windows installation. Once the Service Pack is applied, it takes the place of the Windows distribution media.

To prepare for the Unattended Installation, follow these steps:

Step	Action	Notes
1	Using Endurance Manager, disable IOP2 and CE2.	You can use the Tuple Disable Operation command for tuple 2.
2	If you have the Windows bootable CD in the CD-ROM, remove it.	If you have the Windows CD in the drive, when you boot the computer in Step 3, the Windows setup starts.
3	Boot IOP1 in *Offline Endurance I/O Processor Mode*.	The default is *Operational Endurance I/O Processor Mode*. Be sure to select *Offline Endurance I/O Processor Mode*.
4	On IOP1, launch `MtcPrep.exe.`	`MtcPrep.exe` creates files that prepare the system for the Unattended Installation of the Windows and Endurance software on the CE. The program is located in \Program Files\Marathon Endurance\CE\Setup. At this time, the information you provide is accepted, and the preparation for the installation proceeds. However, if you entered an incorrect Windows product key, later you will be prompted for the correct one.
5	Specify the destination location for the CE's copy of the operating system.	• Drive: Browse to the drive you marked as the boot disk in the Endurance Configuration Utility. • Folder: Indicate the Windows folder. Typically this is `WINNT`.
6	Insert the Windows distribution media in the IOP CD-ROM drive. On the Windows Distribution Media screen, browse to the `\i386` folder.	The Windows installation directory contains the setup utility `WINNT32.exe`, which copies the Windows installation files to the CE boot disk.
7	Answer all questions, providing information applicable to your site, user, and operating system licenses.	
8	After you answer all questions, check **Begin CE Windows installation now** to run the CE Windows installation immediately**.**	If the directory specified in Step 6 is not correct, MtcPrep.exe cannot launch the Unattended Installation setup correctly, and an error appears on the screen. In that case, verify the location of `WINNT32.exe` and run `MtcPrep.exe` again.

Step	Action	Notes
9	Ensure that the automatic reboot of the IOP is in *Operational Endurance I/O Processor Mode* (the default).	After the Unattended Installation setup copies the installation files to the CE's disk, the IOP reboots automatically.
10	Power on CE1.	If you are using a KVM switch instead of a local keyboard, mouse, and monitor, use the KVM switch to change the focus to the CE.
11	Allow the Unattended Installation on the CE to complete.	This process can take up to an hour. The CE reboots after text mode setup and GUI mode setup complete. Note: While software is being installed on the CE, the computer time of the IOPs is incorrect. When Windows installation completes, the time on the CEs and IOPs synchronizes and is correct. Also, the time zone for the CEs matches that of the IOPs, which you specified when installing software on the IOPs.

Continue with *Completing the Unattended Installation*.

Completing the Unattended Installation

The procedure you follow to complete the Unattended Installation of the CE software is dependent upon your specific hardware configuration.

For a KVM Switch

If your configuration contains a keyboard, video, mouse (KVM) switch with a port for each CE and IOP, follow these steps to complete the Unattended Installation of the CE software:

Step	Action	Notes
1	Use the KVM switch in order to view the CE1 video.	Select the port connected to CE1's keyboard, video, and mouse.
2	The Windows screen Configure Your Server should be displayed.	This occurs at the conclusion of step 11 of the previous section, up to one hour after the start of the CE installation. Viewing this screen indicates that Setup has completed on the CE.
3	Use the KVM switch to change focus to the IOP in order to view the IOP's video.	Select the port connected to IOP1's keyboard, video, and mouse.
4	From the application task bar, select **Start** → **Programs** → **Marathon Endurance** → **Endurance Manager** to start the Endurance Manager.	
5	Using the Endurance Manager, invoke the command **CE_O/S Shutdown Operation from IOP*x***, where x is the ID number of the IOP from which you issue the command.	The CE Endurance System Management service initiates the system shutdown.
6	On the IOP, start the CE Desktop application.	For information about the CE Desktop application, refer to Chapter 3 of the *HP Netserver AA Solution Administrator's Guide*. Once the CE has rebooted, the video, keyboard, and mouse are redirected to the IOP.

For a Monitor Attached Directly to the CE

If your configuration contains a monitor attached directly to the CE, follow these steps to complete the Unattended Installation of the CE software:

Step	Action	Notes
1	View the CE video on the CE monitor.	
2	The Windows screen Configure Your Server should be displayed.	This occurs at the conclusion of step 11 of the previous section, up to one hour after the start of the CE installation. Viewing this screen indicates that Setup has completed on the CE.
3	While viewing the IOP's video, from the application task bar, select **Start** → **Programs** → **Marathon Endurance** → **Endurance Manager** to start the Endurance Manager.	
4	Using the Endurance Manager, invoke the command **CE_O/S Shutdown Operation from IOP*x***, where x is the ID number of the IOP from which you issue the command.	The CE Endurance System Management service initiates the system shutdown.
5	On the IOP, start the CE Desktop application.	For information about the CE Desktop application, refer to Chapter 3 of the *HP Netserver AA Solution Administrator's Guide*. Once the CE has rebooted, the video, keyboard, and mouse are redirected to the IOP.

Continue with *Completing Software Installation on the CEs*.

Completing Software Installation on the CEs

Note: You do **not** install CE software on the second CE. The IOPs update the disks via a mirror copy.

After the Windows Unattended Installation completes, the CE reboots, and video is redirected to the CE Desktop application on the IOP. **To view CE video output, you must ensure that the CE Desktop application is running on the IOPs.**

At this time, you will complete steps that could not be performed during the Unattended Installation:

- *Installing the Appropriate Service Pack on the CE*
- *Installing Networking Software on the CE*

Installing the Appropriate Service Pack on the CE

Install one of the currently supported Windows Service Packs and any applicable Microsoft hotfixes on the CE.

Note: Perform this step if you did not slip stream the Windows installation.

For a complete list of supported Service Packs, refer to the *Endurance Release Notes*.

Continue with *Installing Networking Software on the CE*.

Installing Networking Software on the CE

To install the networking software, follow these steps:

Step	Action	Notes
1	On the CE, install the Endurance Ethernet Redirector using the Add New Hardware Wizard. a. Using the Control Panel, start the Add/ Remove Hardware Wizard. b. Click **Add/Troubleshoot a device**. c. Click **Add a new device**. d. Select **No, I want to select hardware from a list**. e. Select **Network Adapters**, then **Have Disk**. f. On the CE boot drive, browse to `*drive*\*folder*\system32\drivers\MtcPnP\netmtcethr.inf`. g. Select **Endurance Ethernet Redirector** (**MtcEthR**). h. Ignore the warning **Digital Signature Not Found**, and continue with the installation. The installation for the Ethernet Redirector completes.	Perform these steps from within the CE Desktop window on the IOP. You may want to consider running the CE Desktop in full-screen mode.
2	Repeat step 1 for the number of redirected Ethernet adapters that you have.	

Step	Action	Notes
3	On the CE, install the Endurance Virtual Network Redirector using the Add New Hardware Wizard. a. Using the Control Panel, start the Add/ Remove Hardware Wizard. b. Click **Add/Troubleshoot a device**. c. Click **Add a new device**. d. Select **No, I want to select hardware from a list**. e. Select **Network Adapters**, then **Have Disk**. f. On the CE boot drive, browse to `drive\folder\system32\drivers\MtcPnP\netmtcvnr.inf`. g. Select **Endurance Virtual Network Redirector** (**MtcVnR**). h. Ignore the warning **Digital Signature Not Found**, and continue with the installation. The installation of the Virtual Network Redirector completes.	You must install the Endurance Virtual Network Redirector **twice** to create two virtual network adapters: the first to connect IOP1, and the second to connect IOP2. *drive\folder* is the drive and directory where you installed the CE copy of Windows. (You can find this in the `%SystemRoot%` environment variable. For example, `C:\WINNT`.) If using the TCP/IP protocol, you must specify the IP addresses because there is no DHCP server on the Virtual Network.
4	Repeat step 3 to install a **second** Endurance Virtual Network Redirector for IOP2.	

Continue with *Adjusting the CE and IOP Event Log Settings*.

Adjusting the CE and IOP Event Log Settings

To adjust the Event log settings, on the CE and on each IOP, right click on **My Computer** → **Manage** → **Event Viewer.** On the Computer Management screen, click **Properties** to set the options for each of the system, application, and security logs. For each log, set the **Maximum Log Size** to at least 1024 KB, and enable **Overwrite Events as needed**.

Continue with Verifying the Endurance Server Installation.

Verifying the Endurance Server Installation

To verify the Endurance server installation:

Step	Action	Notes
1	On the online IOP, start the Endurance Manager, and then use it to enable the CE and IOP in the other tuple.	
2	Use Endurance Manager to verify that a mirror copy is in progress from IOP1 to IOP2.	The copy proceeds from the IOP on which you performed the CE installation to the other IOP. As described on page 3-4, you should have begun the installation by installing the software on the smaller of the disks, typically IOP1, and the mirror copy would be from IOP1 to IOP2.
3	Using the Endurance Manager, issue a **Server Shutdown** command.	
4	After the CEs and IOPs completely shut down, power cycle the CEs and the IOPs.	

Step	Action	Notes
5	Make sure that all computers reboot and that the CEs synchronize.	• Both IOPs must be present for the Endurance server to complete the boot process. Because all I/O devices (including the CE boot disk with the CE operating system) physically reside on the IOPs, the CEs do not begin booting until both IOPs complete their boot process and are available. If the CEs are powered on at the same time as the IOPs, the CEs complete their POST, and then wait for the IOPs to complete their boot process. • After the IOPs complete their boot process, the CEs boot: one CE loads the Windows operating system; then the other CE is synchronized so that both CEs perform all CPU and memory functions in a tightly coupled manner.
6	If necessary, start the CE Desktop application on either IOP.	The CE Desktop application should start automatically.
7	Click in the CE Desktop window and login to the CE operating system.	
8	Start Endurance Manager and make sure that all Endurance server components transition to *active*, *online*, or *standby*.	
9	Using Endurance Manager, disable the active Ethernet connection to make sure that Ethernet access fails over properly, and then re-enable the disabled connection. Alternatively, you can unplug the cable from the active Ethernet connection, re-plug it in, and ensure that Ethernet access fails over correctly.	Verify that client connections are not lost.

SplitSite Installation

To install in a SplitSite configuration, starting at the site of Tuple1:

Step	Action
1	Install all software (Windows and Endurance) on IOP1.
2	Use the Endurance Manager to disable CE1 and IOP1 (tuple 1).
3	Copy the Endurance configuration to a floppy disk.
4	Boot IOP1 in *Operational Endurance I/O Processor Mode.*
5	Use the Endurance Manager to partition the CE boot disk on IOP1.
6	Power on CE1.
7	Go to the site of Tuple 2.
8	Install all software (Windows and Endurance) on IOP2.
9	Load the Endurance configuration file from the floppy you created on IOP1.
10	Correct the Ethernet addresses for the IOP2 redirected network card.
11	Use the Endurance Manager to enable IOP1.
12	Verify that IOP1 joins successfully, and correct any problems.
13	Use the Endurance Manager to disable IOP1.
14	Boot IOP2 in *Offline Endurance I/O Processor Mode*.
15	Install the CE software as described in this manual, replacing references to CE1 with CE2, and IOP1 with IOP2.
16	Complete the CE software installation.
17	Use the Endurance Manager to enable IOP1.
18	Verify that IOP1 joins successfully.
19	Use the Endurance Manager to enable CE1.
20	Verify that CE1 synchronizes successfully.

If it is necessary to complete a single tuple installation before you begin the installation on the second tuple, simply skip the step of installing IOP2 before installing the CE software.

Note: The CE software is installed on only **one** CE. You can install the software on either CE.

Installing the Endurance Manager on a Remote Client

This section describes how to install the Endurance Manager on a remote client. For Endurance Manager information, including information about using Endurance Manager on a remote client, refer to Chapter 4 in the *HP Netserver AA Solution Administrator's Guide*.

You can use Endurance Manager on a remote client to monitor and manage an Endurance server.

To install the Endurance Manager and the Endurance online documentation on a remote client:

Step	Action
1	On the remote client, insert the Endurance CD in the CD-ROM drive. Run the Setup executable.
2	Follow the instructions displayed on the screen, making sure that you select **Endurance Manager** as the setup type. Optionally, you can also select the setup type **Online documentation** to install the online documentation.

When the installation completes, you can use Remote Endurance Manager to monitor and manage your Endurance server. Refer to Chapter 4 of the *HP Netserver AA Solution Administrator's Guide* for information.

What to Do Next

For information about Endurance server operational concepts and a system overview, refer to Chapter 2 of the *HP Netserver AA Solution Administrator's Guide*.

For information about how to use the Endurance Manager to monitor and manage your Endurance server, refer to Chapter 4 of the *HP Netserver AA Solution Administrator's Guide*.

Adding a KVM or Video Switch to the Hardware

A

This appendix discusses adding a keyboard, video, mouse (KVM) switch to the hardware installation, includes information about basic considerations and requirements, and provides examples of installations that use KVM or video switches in an Endurance hardware configuration.

This appendix contains the following sections:

Considerations A-2
Basic Requirements A-3
Examples of an Endurance Installation with a Video or KVM Switch A-4

Considerations

Each CE requires a standard VGA-compatible video adapter. The adapter provides the video BIOS to boot the CE and is used to display the following items:

- POST messages
- BIOS setup, test, and diagnostics
- MS-DOS boot for flashing the MIC
- Operating system flex-boot
- Text phase of the operating system boot
- Initial CE installation

You can monitor and manage the IOPs and CEs from one location by adding a KVM or video switch to your hardware configuration. Depending on your site's physical layout and the configuration of the hardware within the workspace, you can use a KVM or video switch in a variety of ways. For example, you can purchase and install:

- A video switch if you want the IOP and CE in each tuple to share a monitor.
- A 2-channel KVM switch to alternate the monitor and keyboard between the IOP and CE, if you install each tuple in its own rack.
- A single 4-channel KVM switch to alternate the monitor, keyboard, and mouse between the IOPs and CEs if you install both tuples in one rack.

Basic Requirements

When you purchase a KVM switch, you should consider the following requirements. The switch:

- Appears to the computer as a physical keyboard and mouse.
- Simulates the keyboard, monitor, and mouse even when powered off.
- Supports VGA and SVGA high-resolution video.

Examples of an Endurance Installation with a Video or KVM Switch

This section contains illustrations of cabling the video or KVM switch. See Figure 2-1 for an illustration of cabling the Endurance server.

This example shows a configuration of the hardware with a video switch so that the CE and IOP in each tuple can share a monitor.

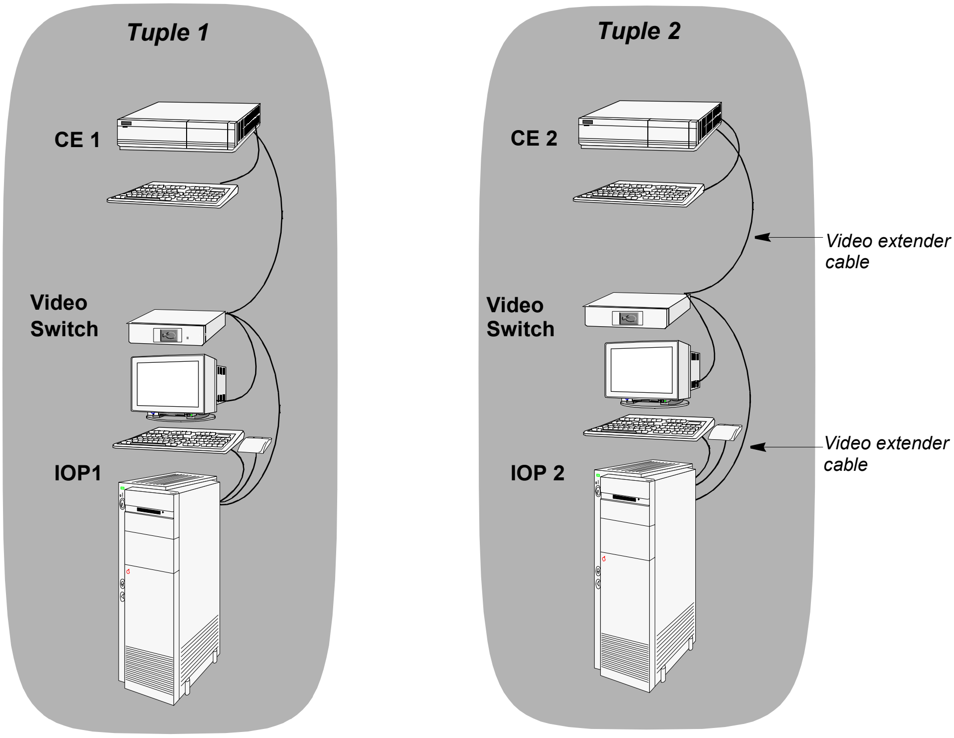


Figure A-1 Hardware Configuration with a Video Switch

This example shows a configuration of the hardware with a KVM switch so that the IOP and CE in each tuple can share a monitor, keyboard, and mouse.

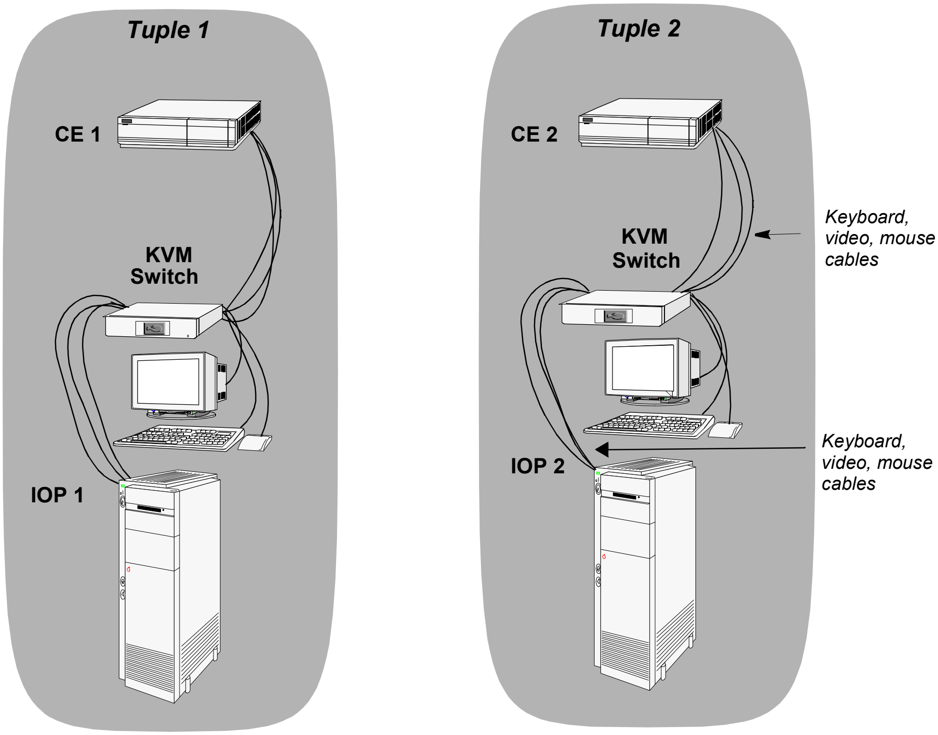


Figure A-2 Hardware Configuration with a KVM Switch for Each Tuple

This example shows a hardware configuration of both tuples in a single rack with a KVM switch so that the IOPs and CEs can share a monitor, keyboard, and mouse.

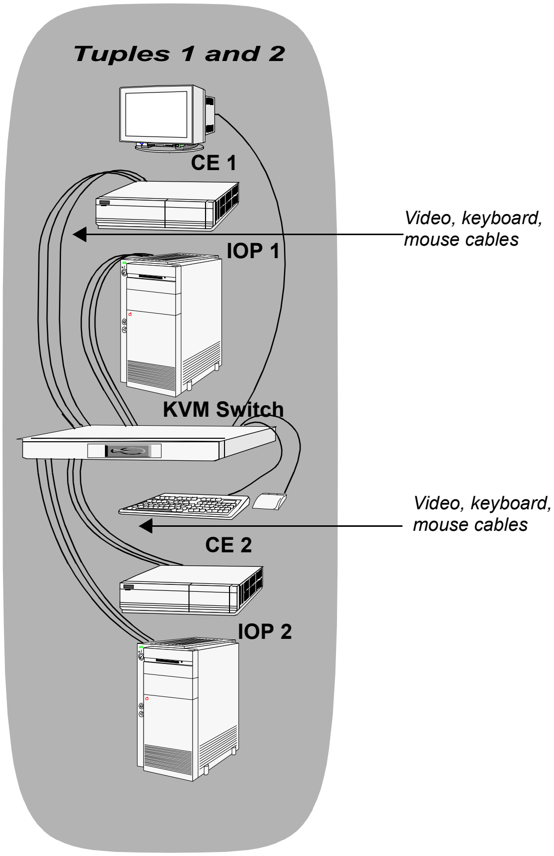


Figure A-3 Hardware Configuration with a KVM Switch for Both Tuples in a Single Rack

Cabling

To cable the switch, follow the switch manufacturer's instructions.

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